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CLICK HERE FOR CHIEF EXECUTIVE OFFICER'S REPORT DATED JUNE 18, 2012

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CLICK HERE FOR CHIEF EXECUTIVE OFFICER'S REPORT DATED JANUARY 22, 2013

County of Los Angeles
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WILLIAM T FUJIOKA
Chief Executive Officer



August 22, 2012

To: Supervisor Zev Yaroslavsky, Chairman
Supervisor Gloria Molina
Supervisor Mark Ridley-Thomas
Supervisor Don Knabe
Supervisor Michael D. Antonovich

From: William T Fujioka
Chief Executive Officer

**SECOND STATUS REPORT ON LOS ANGELES COUNTY INFORMATION TECHNOLOGY DISASTER RECOVERY CENTER (ITEM 10, AGENDA OF MAY 15, 2012)**

On May 15, 2012, the Board, on motion of Supervisor Knabe, instructed the Chief Executive Office (CEO), in conjunction with the Chief Information Officer (CIO) and the Director of the Internal Services Department (ISD), to:

1. Report back within 30 days with a preliminary report on a recommended site, cost estimates, expedited project timeline and funding or financing approach to create a County IT Disaster Recovery (DR) center to be used by all County departments;

2. Explore other options outside of constructing a facility, i.e., a "cloud"; analyzing how the County might achieve economies-of-scale, and easier manageability and maintenance, while ensuring a secure environment for the County's critical systems and data;

3. Include in the report operational and energy efficiencies, cost savings and/or cost avoidance associated with the project; and

4. Develop directives and policies needed to implement a County IT DR center.

We provided the Board with an initial status report on June 18, 2012 (attached). This memorandum provides an update on activities within the last 60 days.

## DISASTER RECOVERY CENTER SITE REVIEW

A county owned local DR Center would replace the current facility leased from Orange County to back up all critical County IT systems. In June, we reported that the CEO, CIO and ISD were reviewing potential County sites for a local DR center based on several criteria, including:

- Appropriate distance between the primary Downey data center & local DR center so that both facilities would not be disrupted by a single event, such as an earthquake, wildfire, etc.
- Avoid potential site problems such as geotechnical issues (known faults-liquefaction, flood zones, security concerns, etc.)
- Adequate access to power, water, and network infrastructure
- At least 15,000 square feet of available data center space
- Ability to access the site for routine or disaster operations

As previously reported, the County team identified the Pomona Fairplex site for further analysis. A Department of Public Works' (DPW) consultant has identified significant requirements to adapt the Fairplex site and building for local DR center use. To finalize cost and time estimates, the CEO is in discussions with the Fairplex Association regarding acquisition and construction options. If the Fairplex site is determined to be optimal, details will be brought to the Board for consideration.

The team is also reviewing ISD's Eastern Avenue warehouse as a potential local DR center site. This location may have certain advantages over the Fairplex site, such as building readiness and suitability, better access to communications and power infrastructure, closer proximity to County emergency operations, etc. The Eastern Avenue location is approximately 10 miles from the planned primary data center site in Downey. A consultant has preliminarily evaluated the seismic/geological risk resulting from this closer proximity, including nearby earthquake faults, liquefaction and landslide potential, and flood plain risks for the Downey and Eastern Avenue sites. The preliminary analysis indicates that Eastern Avenue is potentially viable as a local DR center site. Based on these findings, an in-depth analysis of the Eastern Avenue site will be performed, to include structural, power, and mechanical characteristics.

A wide range of factors, to include cost and timeframe, will be considered in the site evaluations. The County team continues to assess each site, and will update the Board in our next status report.

## ALTERNATIVES TO CONSTRUCTING A COUNTY-OWNED FACILITY

In our June report, we discussed other options for providing DR and data center services, including:

- Expanding and extending the Orange County Local Recovery Center lease
- Leasing an existing data center
- Leasing shared (co-location) space
- Cloud Based Recovery-as-a-Service and Disaster Recovery-as-a-Service

None of these alternatives appears to provide the functionality of a County-operated DR center without additional investments. In discussions, the Board's deputies asked that we assess whether the "cloud" could provide certain aspects of DR more economically. In response, ISD and the CIO met with outside experts, such as Gartner, IBM, and Forrester Research, to explore ways to use the cloud for DR.

These discussions reconfirmed that cloud DR is available primarily to small- to mid-sized operations, but not for organizations with the size and computing complexity of Los Angeles County. We also contacted several vendors that provide "turnkey" DR services. These services are primarily focused on a portion of the County's computing environment (e.g., highly virtualized servers), but not the multi-tier computing environment, including midrange and mainframe computers, now required by the County.

However, we found that tertiary data storage in the cloud could play an important part in an overall DR strategy for the County. This strategy would combine a state-of-the-art primary County data center in Downey, a secondary local County DR center (to be developed), and tertiary data storage that would be accessed should both primary and secondary sites be disabled. ISD and the CIO will continue to explore cloud data storage as part of this overall strategy.

Our discussions with outside data center experts also focused on "best practices" in DR planning. To ensure that County DR planning reflects industry best practices and the most cost effective options, we may engage consultants if needed for targeted assessments.

## COUNTY DISASTER RECOVERY READINESS

During July 2012, the CIO conducted a follow-up countywide survey to the application survey completed in 2010 relating to DR readiness for all departmental applications. Departments identified a total of 1634 applications, of which they identified 802 (49%) as "mission critical". Of these 802 critical applications, 98 (12%) do not have off-site back up or disaster recovery. These initial survey results may not reflect the actual number of departmental systems that are fully recoverable during a disaster. The CIO will continue to work with departments to refine the initial survey data to ensure consistency and accuracy.

It should be noted that departments were required to self-identify their critical applications. Consistent with industry best practices, the CIO will lead an initiative to assess the criticality of all departmental applications that require DR from a countywide risk standpoint. This analysis will provide valuable information to correctly size the local DR center and ensure that commensurate disaster recovery plans are in place based on the criticality of the applications.

In the Final Changes phase of the Fiscal Year 2012-13 budget, the Board approved $1.45 million of carryover funding in ISD's operating budget for server virtualization (i.e., the merger of many server computers onto one larger server). Server virtualization will create operating efficiencies, reduce future equipment replacement and significantly reduce energy usage. Priority will be given to those servers with applications that are identified as critical, but which do not have current DR capabilities. Virtualization is a critical component for cost-effective DR implementation and is a required step before computing operations can be consolidated countywide.

## NEXT STEPS

Over the next 90 days, this Office, ISD, and the CIO will:

- Continue to evaluate the two potential local County DR sites and others if identified. This will include a comprehensive seismic evaluation of the Eastern Avenue site.
- Continue to develop DR strategies that reflect industry best practices, including application tiering, and the potential use of the cloud for tertiary data storage.
- Continue to assess cost-effective DR options as they develop.
- Continue to refine the list of critical County applications that require DR capability.
- Continue to virtualize servers to prepare for future data center consolidation.

We will continue to keep the Board informed, and will provide another status report within 90 days. If you have any questions, please contact Ellen Sandt at (213) 974-1186.

WTF:EFS
SAW:ef

Attachment

c: Executive Office, Board of Supervisors
County Counsel
Chief Information Office
Information Technology Board Deputies
Internal Services

Attachment

County of Los Angeles
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WILLIAM T FUJIOKA
Chief Executive Officer



June 18, 2012

To: Supervisor Zev Yaroslavsky, Chairman
Supervisor Gloria Molina
Supervisor Mark Ridley-Thomas
Supervisor Don Knabe
Supervisor Michael D. Antonovich

From: William T Fujioka
Chief Executive Officer

**STATUS REPORT ON LOS ANGELES COUNTY DISASTER RECOVERY DATA CENTER (ITEM 10, AGENDA OF MAY 15, 2012)**

On May 15, 2012, the Board, on motion of Supervisor Knabe, instructed the Chief Executive Office (CEO), in conjunction with the Chief Information Officer (CIO) and the Director of the Internal Services Department (ISD), to:

1. Report back within 30 days with a preliminary report on a recommended site, cost estimates, expedited project timeline and funding or financing approach to create a Los Angeles County disaster recovery center to be used by all County departments;

2. Explore other options outside of constructing a facility, i.e., a "cloud"; analyzing how the County might achieve economies-of-scale, and easier manageability and maintenance, while ensuring a secure environment for the County's critical data;

3. Include in the report operational and energy efficiencies, cost savings and/or cost avoidance associated with the project; and

4. Develop directives and policies needed to implement a Los Angeles County Disaster Recovery Center.

This memorandum provides a progress report to create a Los Angeles County Disaster Recovery Data Center.

## BACKGROUND

Since decentralization of information technology began in the late 1980's, most County departments began to acquire and operate computers from their own facilities. Some departments have taken action to secure their computer systems, but few have made the kind of operating or facility provisions that enable continued operations during a disaster, such as a fire, flood, power outage, or earthquake.

Based on a survey conducted by the CIO, County departments reported that they operate a total of 64 computer rooms or data centers. Of these, 60 percent of data centers do not have backup generators in the event of a power outage, 41 percent of the departments' self-identified critical business applications are not recoverable after a disaster, and 78 percent do not backup data from their main data center to a disaster recovery site.

For County applications that are hosted by ISD at its Downey data center, ISD provides disaster recovery (DR) services at its Local Recover Center (LRC). The LRC includes County-owned and dedicated computers and storage units housed at leased space within the Orange County data center in Santa Ana.

ISD's approach to DR is to ensure that all critical data in the Downey data center is duplicated within disc storage devices at the LRC. This enables quick operational recovery at the LRC if necessary. As an additional precaution, critical data is also stored on magnetic tape.

At the LRC, duplicate (parallel) computer systems are connected to the duplicated storage devices. In the event of a disaster affecting the Downey data center, these computers would assume the workload and continue to operate. Additionally, ISD has provisioned telecommunications networks so that departmental workstations will have connectivity to either Downey or the LRC. This provides access to systems, the Internet and to the County's business partners (e.g., banks and State systems).

The environment created by ISD within the LRC is a hot site, with full computer systems and real time synchronization to mirror the data environment of the primary Downey data center. The LRC will continue critical operation of applications and systems in the event of a local or regional emergency. This is the desired state envisioned for all County departments where critical resources are locally available in a modern computing infrastructure.

The following sections of the memo provide a status on the information acquired to date regarding the various options for IT disaster recovery service.

## DISASTER RECOVERY DATA CENTER SITE REVIEW

To analyze the option of a local disaster recovery center owned and operated by the County, this Office worked with the CIO and ISD to develop a plan that will support data center consolidation by using shared infrastructure resources. Additionally, mirroring ISD's success, we evaluated potential options for a County-owned recovery center that can be quickly

constructed to provide a L.A. County hot site DR facility for all departments. The vital need for a local DR data center site was highlighted during disasters such as the 9-11 terrorist attacks or Hurricane Katrina, when transportation systems were severely restricted or completely unavailable.

The CEO, CIO and ISD are reviewing potential County sites for a disaster recovery data center based on the following criteria:

- Appropriate distance between the primary Downey data center & DR center so that both facilities would not be disrupted by a single event, such as fire, windstorm, earthquake, etc.;
- Avoidance of potential site problems, such as geotechnical issues (known faults-liquefaction), flood zones, security concerns, etc.;
- Adequate access to power, water, and network infrastructure;
- At least 15,000 square feet of available data center space;
- Ability to access the site for routine or disaster operations.

To minimize costs, the team reviewed existing County owned buildings and real estate in Lancaster, Pacoima, Castaic, and Pomona. Based on this review, the Pomona Fairplex site was identified as a potential location deserving of further analysis by the Department of Public Works (DPW). The Pomona Fairplex Association is in the process of developing a business park in this area.

DPW has engaged a consultant to conduct a feasibility study of the Pomona Fairplex location for use as a DR data center. The consultant's preliminary report identified upgrades that will be required to adapt the building for data center use. DPW is working with the consultant to refine cost and time estimates to determine the feasibility of this site. We will report the outcome of this feasibility review to your Board in our next status report.

## ALTERNATIVES TO CONSTRUCTING A COUNTY- OWNED FACILITY

In addition to a review of County-owned sites, we also assessed other options for provisioning DR data center services. These options are not recommended due to their cost, availability, or suitability to meet the County's needs, as indicated below.

- Expanding and Extending the Orange County Local Recovery Center (LRC) lease. For the existing LRC, ISD leases 4,800 square feet from Orange County at an annual cost of $767,000 plus utilities. Orange County representatives have indicated that additional space could be made available. However, the data center mechanical infrastructure needs to be significantly increased to handle Los Angeles County's requirements. Even with upgrades, it would be difficult to achieve the required power efficiencies/savings at this facility. Further, the cost of leased space is expected to increase over time, and Los Angeles County requires increased space for its essential applications. Based on these factors, lease costs are projected to exceed costs for other alternatives.

- Cloud Based Recovery-as-a-Service (RaaS) and Disaster Recovery as a Service (DRaaS). The project team conducted research and consulted with Gartner, a leading information technology research and advisory firm, on both RaaS and DRaaS in the public cloud computing environment. Discussions with Gartner's analyst concluded that RaaS is currently a niche market, primarily directed for small to mid-size firms, with agreements in the range of $45,000 to $75,000 annually. Nothing is being reported with government agencies close in size and complex mix of computing platforms to the County. Additional research with leading DR vendors; such as IBM and Verizon, revealed that vendors do not typically offer support for all of the various computing systems used by the County (e.g., mainframes, UNIX computers plus high-end X86 servers). Any vendor DRaaS proposal for the County at this time would be a custom, one-of-a kind solution. Other complicating factors in considering either RaaS or DRaaS are privacy, security and telecommunication bandwidth, and physical location of the data storage.

  RaaS addresses data and system storage solutions primarily for the computer server environment. However, issues relating to privacy, security and bandwidth persist and would need to be addressed. Additionally, RaaS does not meet the hot site desired state for full disaster recovery. To be effective, RaaS requires an alternative computing facility with machines comparable to the original environment to download data and begin operation.

  The DRaaS solution has many of the same issues as RaaS relating to security and bandwidth. Additionally, County systems' size, diversity (mainframes, UNIX and high-end servers) and complexity (e.g., telecommunication service requirements to County facilities plus banks, local agencies and State extra-net connections) make DR services from an individual provider problematic and costly.

- Leasing an existing data center. In 2011, ISD worked with CEO Real Estate Division and outside brokers to identify available data centers within Los Angeles County that met basic needs at an affordable cost. A list of available sites was reviewed, including site visits as appropriate, but none were found suitable or cost effective.

- Leasing shared (co-location) space. In December 2011, a team comprised of staff from ISD, CIO, CEO and DHS visited two commercial data centers in Arizona and Nevada. These visits provided useful information regarding the efficiencies to be achieved by using modular racks (or containers) to hold mechanical and computing infrastructure. These vendors did not offer hosting services for mainframe and Unix systems and neither company met the requirement for ease of access by operational staff in the event of a disaster. The team also visited several known Los Angeles County based data center operations seeking co-location leases and found them to either be older data center designs that do not accommodate a

modular, high server density model. These offerings required a long-term commitment at a higher costs than the current LRC.

## POTENTIAL OPERATIONAL AND ENERGY EFFICIENCIES

The most efficient computing environment consolidates all essential County applications into one primary data center, which would replicate data to one countywide DR data center. This structure permits servers to be consolidated and virtualized, providing large savings in hardware costs, power consumption, network infrastructure (e.g., switches, wide area network circuits), and other costs (e.g., uninterruptable power supply [UPS] systems, power distribution systems).

With support of this Office and the CIO, ISD has developed an environment for County departments that leverages server virtualization techniques and, in many ways, is analogous to what is referred to as Infrastructure as a Service (IaaS), a public Cloud offering. This technique has been proven to reduce the number of physical servers, electrical power usage, and required floor space.

Leveraging this technology, ISD will be able to host servers and systems for County departments within its data center. Additionally, this capability easily enables the transfer of systems between sites, which is ideal in a hot site disaster recovery scenario.

ISD, CIO, and CEO are developing 20-year cumulative avoided cost estimates by comparing the County's business-as-usual decentralized data center operations and decentralized DR to a centralized data center model at one countywide primary and one centralized DR data center. While the team continues to evaluate the various options for DR data center services and potential savings, the following initial cost avoidances and savings have been calculated:

| | |
|---|---|
| Avoided costs for DR data center lease over 20 years | $18 million |
| Avoided costs for power over 20 years | $15 million |
| Shared computing savings (both primary and DR site) | $42 million |
| Other avoided costs over 20 years (UPS, power dist.) | $8 million |
| Total avoided costs over 20 years | $83 million |

Reduced data center power consumption also provides environmental benefits. Projected power savings will reduce the County's production of greenhouse gases by an estimated 2,164 tons per year, or roughly 1 percent of the County's total greenhouse gas emissions reduction target for 2020.

## DATA CENTER DIRECTIVES AND POLICIES

The CIO has been working with departmental information technology (IT) managers to prepare for the various stages necessary to facilitate DR. For example, server virtualization (the merger of many server computers onto one larger server) has been an activity involving most County departments for some time. This Office recently issued a directive to merge departmental email

systems and provide a single email service for all departments. The CIO's reviews of IT procurements will provide visibility to expenditures to data centers, storage, and computer equipment to ensure that purchases align with the vision and direction of this Office.

Working with this Office and the CIO's Council, the CIO will be preparing additional directives, and, where necessary, policies for Board consideration that will further cost reduction and protect County systems and assets. This effort will include potential directives for the consolidation and virtualization of data and application servers and data storage devices.

**NEXT STEPS**

Board deputies were provided with a briefing of the preliminary response to the motion at the June 7, 2012 Operations Cluster meeting. Several questions were raised for discussion and further research; specifically, whether the "Cloud" could perform certain aspects of the DR concept more economically, such as using data backup services in the Cloud instead of current tape backup system. The CIO and ISD will continue to meet with DR vendors to research turn-key DR solutions currently offered for agencies the size, scope and complexity of the County of Los Angeles.

In a parallel effort, the CIO will be working with departments to perform a comprehensive analysis of all County-run applications to assess their criticality and suitability for DR. Currently, it is estimated that approximately 35-40percent of the County's applications will require immediate recovery in the event of a major emergency.

This Office, ISD, and the CIO will pursue answers to the questions presented at the June 7th briefing and will continue assessing the feasibility of DR data center options to identify those providing appropriate hot-site capabilities at a reasonable cost and within identified parameters. We will continue to keep your Board informed and will provide another status report to your within 60 days.

If you have any questions regarding this matter, please contact Ellen Sandt at (213) 974-1186 or esandt@ceo.lacounty.gov

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c: Executive Office, Board of Supervisors
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WILLIAM T FUJIOKA
Chief Executive Officer



January 22, 2013

To: Supervisor Mark Ridley-Thomas, Chairman
Supervisor Gloria Molina
Supervisor Zev Yaroslavsky
Supervisor Don Knabe
Supervisor Michael D. Antonovich

From: William T Fujioka
Chief Executive Officer

**LOS ANGELES COUNTY DISASTER RECOVERY DATA CENTER FINAL REPORT (Item 10, Agenda of May 15, 2012)**

On May 15, 2012, the Board, on motion of Supervisor Knabe, instructed the Chief Executive Office (CEO), in conjunction with the Chief Information Officer (CIO) and the Director of the Internal Services Department (ISD), to:

1. Report back within 30 days with a preliminary report on a recommended site, cost estimates, expedited project timeline and funding or financing approach to create a County disaster recovery center to be used by all County departments;

2. Explore other options outside of constructing a facility, i.e., a "cloud"; analyzing how the County might achieve economies-of-scale, and easier manageability and maintenance, while ensuring a secure environment for the County's critical data;

3. Include in the report operational and energy efficiencies, cost savings and/or cost avoidance associated with the project; and

4. Develop directives and policies needed to implement a County Disaster Recovery Center.

We provided the Board with status reports on June 18, 2012, and August 22, 2012. On November 8, 2012, we advised the Board of work in progress, and committed to provide a recommendation for a scalable DR data center solution by January, 2013.

## SUMMARY

After review of various sites, the County team comprised of ISD, CIO and CEO recommends ISD's Eastern Avenue warehouse as the site for a new County disaster recovery (DR) data center. The Eastern Avenue warehouse is more economically adaptable to data center use than the other sites reviewed, and is scalable to meet projected countywide DR data center needs.

The capital project cost is estimated at $32.9 million and includes construction, mechanical and electrical, telecommunications, architectural and engineering, project management, and modular data center infrastructure. On completion of the facility renovation, computing equipment will be moved from the existing Local Recovery Center (LRC) in Santa Ana to the Eastern Avenue site.

The CEO's November 26, 2012, "Report on Proposed Bond Financing for Future Capital Projects and County Bond Capacity" included the DR data center project at $35 million on the project list.

## EVALUATION OF DR DATA CENTER SITE OPTIONS

### Seismic Evaluation

As reported in November 2012, the County team worked closely with SPA Risk, LLC, contract seismic experts, to assess locations for a secondary DR data center site. The experts evaluated the probability that a single event (e.g., earthquake, fire, flood, etc.) could disable both the planned Downey data center and each proposed secondary DR data center site. Possible DR sites included the Fairplex complex in Pomona, ISD's Eastern Avenue warehouse in East Los Angeles, the Mira Loma/High Desert complex in Lancaster, an ISD Telecommunications site in Pacoima, and the LRC in Santa Ana.

SPA Risk reported there was a low level of risk that a single seismic event would render both the primary and secondary data centers inoperable. When each proposed DR site is evaluated in tandem with the Downey data center, each site (including any proposed building modifications) would achieve the experts' target level of risk of less than 1% of simultaneous operational failure due to earthquake during a 50 year period.

Based on this analysis, the team compared the capital project costs to develop a DR data center site at the various locations. Because the ISD Eastern Avenue warehouse requires less new construction, its initial cost estimate at $32.9 million is less costly than other sites reviewed. Project costs for other potential sites requiring new construction, and excluding potential land acquisition or development costs, are estimated at $40.5 million (Attachment I, top).

Cost Comparison of Eastern Avenue to the Local Recovery Center

The team analyzed the 20-year capital and operating costs for the proposed Eastern Avenue site compared to expanded LRC space in Santa Ana.

Los Angeles County's existing DR solution consists of nearly 5,000 square feet of leased space at Orange County's data center in Santa Ana. The existing space is suitable for low-density server technology, which is becoming outdated. To meet future needs, ISD has estimated the countywide DR data center requirement at 120 high-density server racks. This will require LRC space to be expanded to 6,000 square feet, and developed with $28 million in improvements (e.g., modular cabinets, power modules, chillers, etc.) for high-density computing.

Excluding bond financing costs, the aggregate cost over 20 years for the Eastern Avenue site is estimated at $32.9 million, compared to $51.5 million for the expanded LRC in Santa Ana (Attachment 1, bottom). This estimate includes capital upgrades for each facility (e.g., modular technology to attain required power and cooling efficiencies), construction and related costs, and lease costs as applicable. The cost comparison excludes power, cooling, and maintenance costs, which are expected to be similar at either facility based on planned upgrades. Much of the cost difference is due to approximately $1 million in annual LRC rental costs, which are avoided at the County-owned Eastern Avenue site.

If we include bond interest and financing costs in the above comparison, the 20 year aggregate cost for Eastern Avenue is estimated at $54.1 million, versus the LRC estimate at $67.8 million.

## POTENTIAL ADDITIONAL OPTION

We recently learned that there may be another viable option for DR data center in another building in downtown Los Angeles. This information is extremely preliminary and we are investigating this potential location. If it appears viable, a seismic study will need to be done for this new location.

## CONSTRUCTION TIME ESTIMATE AND LRC LEASE EXTENSION

Should the DR data center be approved for Eastern Avenue, the project can be completed within 18 - 24 months. An additional six months may be required to transition equipment from the LRC to the new DR facility.

The County's existing lease for LRC space expires in November, 2013. Thus, ISD will require a lease extension at the LRC until a new facility can be developed and occupied. ISD will seek the Board's approval to extend the LRC lease with Orange County for two years, with three one-year optional extensions should the DR data center project encounter unforeseen delays.

If the Eastern Avenue site is not developed, then the LRC space will need to be expanded and extensively upgraded with modular infrastructure to accommodate 120 high-density server racks.

## OTHER ITEMS

The County team has completed several other critical components of this analysis:

- The CIO has completed departmental system assessments to define their criticality and recoverability following a disaster. The CIO met with IT and business leaders in each department. Based on these meetings and departments' Business Automation Plans, approximately 1,500 computer applications were identified. Departments identified roughly 40% as mission critical for recovery purposes after a disaster. Of these, approximately 9% of mission critical applications have no disaster recovery plans.

Disaster recovery preparedness ranges from very prepared to less than ideal. The CIO will work with departments to develop plans to recover mission critical applications following a disaster.

The benefits attained by meeting with each department included:

  - Engaging departments in focused discussions to identify and prioritize the applications that must be available after a disaster, and the recovery objectives in terms of hours or days.

  - Counseling departments that host their own applications, or have contractors host them, to think through their disaster recovery plans to ensure the plans are consistent with business requirements. Subsequently, several departments have made changes to their disaster recovery planning, and/or have engaged in disaster recovery discussions with vendors.

  - Advising departments to consider using ISD's shared computing infrastructure to ensure disaster recovery preparedness for their mission critical applications.

  - Providing ISD with a list of tiered mission critical applications that are hosted in Downey, including the recovery objective for each application in terms of hours or days. In case of disaster, having this information will enable ISD to execute a recovery plan.

- IBM has been engaged to compare and validate the County's plans for DR data center operations with IBM's Availability Architecture Framework. A report is expected by February 28, 2013.

- ISD and the CIO have evaluated the current market for cloud-based DR and backup solutions. As previously reported, commercially available DR data center services do not meet the County's needs for a large, complex computing environment. However, the cloud offers viable solutions for tertiary data storage and tape backup solutions that will be considered before renewing backup software agreements or expanding backup infrastructure.

- ISD recently completed a cost comparison of public cloud backup services before deciding to purchase hardware to expand the County's internal computer backup capacity. The public cloud solution was found to be expensive for large customers, over three times the cost over three years, though still feasible for small to medium customers. ISD and some other departments are in the third year of a five-year enterprise agreement for computer backup software and services. Public cloud options will be considered when this agreement comes up for renewal in 2015.

- The CIO has prepared a draft County Directive on server virtualization and consolidation, which is a step toward efficient disaster recovery. The draft is currently being vetted with the CIO Council, CEO and IT Board Deputies.

The DR data center recommendation was presented to your Board's deputies at the January 17, 2013, Operations Cluster meeting. After receiving feedback from that briefing, the results of the IBM review, and evaluating the new potential site recently identified in the downtown area, we will proceed with next steps to develop a scalable DR data center.

If you have any questions, please contact Scott Wiles at (213) 893-1246 or swiles@ceo.lacounty.gov.

WTF:EFS:SAW:ef

Attachment

c: Executive Office, Board of Supervisors
Information Technology Board Deputies
Chief Information Office
Internal Services

# FAIRPLEX vs. EASTERN

## SITE COST COMPARISON

| Description | Fairplex | | Eastern | Difference |
|---|---|---|---|---|
| **Construction Cost (including contingency)** | $12,675,958 | | $9,488,155 | $3,187,803 |
| **Construction Fees (design, permits, inspections, etc...)** | $6,089,113 | | $2,958,694 | $3,130,419 |
| **Total Tenant Improvement Cost** | **$18,765,071** | (1) | **$12,446,849** | **$6,318,222** |
| **Modular Data Center Equipment Cost** | $21,791,630 | | $20,488,650 | $1,302,980 |
| **Total Cost** | **$40,556,701** | | **$32,935,499** | **$7,621,202** |

**Notes:** (1) Does not include building purchase / lease costs

# LOCAL RECOVERY CENTER

## LEASE vs. OWN - 20 YEAR COMPARISON

| | Lease- Orange County | | | | | Own - ISD Eastern Ave. | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Description** | **SqFt** | **$/Sq Ft** | **Annual** | **20 Years** | | **SqFt** | **$/SqFt** | **Annual** | |
| Additional Lease at Orange County ($12.88/sf/mo) | 6,000 | 154.60 | 927,600 | 21,499,514 | (1) | 15,000 | - | | (2) |
| Local Support (Xerox/ACS) | | | 87,000 | 2,011,759 | (1) | | | | |
| **Subtotal Lease & Support Costs** | **6,000** | | **1,014,600** | **23,511,273** | | | | | |
| | | | | **1-Time Cost** | | | | **1-Time Cost** | |
| Orange County Tenant Improvements and Modular | | | | 27,954,697 | (3) | | | | |
| Eastern Avenue Tenant Improvements and Modular | | | | | | | | 32,935,498 | (3) |
| **Subtotal Infrastructure Improvements & Modular Costs** | | | - | **27,954,697** | | | | **32,935,498** | |
| **Total 20 Year Comparison** | | | | **51,465,970** | | | | **32,935,498** | |

**Notes:**

(1) Includes 1.5% annual increase in estimated lease payments. Current reflects actual cost. Future reflects estimated cost with added space.

(2) Hardened space includes: modular rack space, electrical rm, mech rm, storage/office, restrooms; initial modular rack install will occupy approx 6000sf
Annual recurring maintenance, power/cooling cost (PUE = 1.4) estimated at $3.55M (annual power & cooling $2.8 M; annual maintenance $750K); same for both sites

(3) 1-time costs only for comparison, any bond financing will have additional costs.